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Strain Induced Crystal Superstructure in Manganite Films YEONG-AH SOH, Dartmouth College, ZAHIRUL ISLAM, JONATHAN LANG, GEORGE SRAJER, Argonne National Laboratory, NEIL MATHUR, MARK BLAMIRE, University of Cambridge — Using xray diffraction we studied in detail the crystal structure of a 100 nm thick $La_{0.7}$ $Sr_{0.3}MnO_3$ film grown on a $SrTiO_3$ substrate. Satellite peaks are observed at ($H \pm \delta h$, K, L) for nonzero K and (H, $K \pm \delta k$, L) for nonzero H. No satellite peaks are observed around (0 0 L) reflections. Our measurements show that the modulation wave vectors and polarization vectors representing the atomic displacements are perpendicular to each other and point in the direction parallel to the plane of the film. L scans around the main Bragg peaks and around the satellite peaks exhibit strong Laue oscillations indicating that the superstructure is coherent throughout the whole thickness of the film. We will discuss the results of the xray measurements in connection with the scanning probe microscopy measurements done on the same film.

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